Munich Cancer Registry



- Survival
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ICD-10 C37: Thymus cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	341
Diseases	342
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m



Munich Cancer Registry Cancer Registry Bavaria - Upper Bavaria Regional Center at Klinikum Grosshadern/IBE Marchioninistr. 15 Munich, 81377 Germany

https://www.tumorregister-muenchen.de/en

 $https://www.tumorregister-muenchen.de/en/facts/base/bC37_E-ICD-10-C37-Thymus-cancerincidence-and-mortality.pdf$

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Global Statements about the statistics on the Internet -

Baseline Statistics (grey button ____), Survival (red button ____)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases^{##} and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases^{###} are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, December 2021

- [#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).
- ^{##} Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.
- ### DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C37	Malignant neoplasm of thymus

INCIDENCE

Table 1

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (incl. DCO)

				Prop.			
				at least	Prop.		
				1 further	at least		
				malign.	1 further		Prop.
	All	DCO	Prop.	prior +	malign.	Prop.	actively
Year of	cases	cases	DCO	synchron.	after	deaths	followed
diagnosis	n	n	00	00	00	00	olo
1998	6			0.0	9.9	50.0	100.0
1999	4			0.0	9.1	50.0	100.0
2000	3			7.7	9.2	100.0	100.0
2001	4	2	50.0	5.9	9.3	75.0	100.0
2002	13			10.0	9.1	84.6	92.3 #
2003	5			8.6	9.2	80.0	100.0
2004	12	1	8.3	8.5	8.6	66.7	91.7
2005	8	1	12.5	9.1	8.0	62.5	100.0
2006	15	1	6.7	10.0	8.2	66.7	86.7
2007	18	1	5.6	9.1	8.3	55.6	88.9 #
2008	20	2	10.0	12.0	7.6	55.0	95.0
2009	25	1	4.0	12.8	7.4	68.0	100.0
2010	14			12.2	6.9	57.1	100.0
2011	15	1	6.7	11.7	5.8	46.7	100.0
2012	20			12.1	5.1	45.0	95.0
2013	18	1	5.6	12.0	4.5	55.6	94.4
2014	18	1	5.6	12.4	4.3	44.4	100.0
2015	18			14.0	4.1	33.3	88.9
2016	12			14.1	3.9	16.7	100.0
2017	16	2	12.5	15.2	4.3	37.5	100.0
2018	27	1	3.7	15.1	3.9	14.8	100.0
2019	28			16.0	4.1	21.4	100.0
2020	23			16.4	4.5	4.3	100.0 ##
1998-2020	342	15	4.4	16.4	9.9	45.0	96.8

342 cases diagnosed 1998-2020 are related to a total of 341 patients. Currently, in 84 (24.6 %) of these 341 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 62 / 17 / 5 (18.2 % / 5.0 % / 1.5 %) patients exist having 2 / 3 / 4+ malignancies.

- # The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.
- ## Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:

In 2018, a subgroup of 27 cases has been diagnosed, of which 15.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (MALES) (incl. DCO)

			DCO	Prop.	Prop. at least 1 further malign. prior +	Prop. at least 1 further malign.	Prop.	Prop. actively
Year of	Males	Males	cases	DCO	synchron.	after	deaths	followed
diagnosis	n	olo	n	010	90 00	00	olo	00
1998	4	66.7			0.0	11.6	50.0	100.0
1999	3	75.0			0.0	10.7	33.3	100.0
2000	2	66.7			11.1	10.9	100.0	100.0
2001	1	25.0	1	100.0	10.0	11.0	100.0	100.0
2002	9	69.2			15.8	11.0	88.9	88.9 #
2003	4	80.0			13.0	11.0	75.0	100.0
2004	5	41.7			14.3	10.7	80.0	100.0
2005	5	62.5	1	20.0	15.2	9.7	100.0	100.0
2006	9	60.0	1	11.1	14.3	10.1	66.7	77.8
2007	7	38.9			14.3	10.0	57.1	100.0 #
2008	11	55.0	1	9.1	18.3	9.7	54.5	100.0
2009	12	48.0	1	8.3	16.7	8.9	58.3	100.0
2010	5	35.7			15.6	9.0		100.0
2011	7	46.7			15.5	7.5	42.9	100.0
2012	12	60.0			16.7	7.1	50.0	100.0
2013	11	61.1			15.9	5.7	54.5	100.0
2014	15	83.3	1	6.7	15.6	6.6	40.0	100.0
2015	8	44.4			17.7	6.5	37.5	100.0
2016	5	41.7			17.8	5.6	40.0	100.0
2017	8	50.0	1	12.5	18.9	6.1	25.0	100.0
2018	14	51.9	1	7.1	17.8	4.9	21.4	100.0
2019	19	67.9			18.2	3.7	26.3	100.0
2020	10	43.5			19.4	11.1	10.0	100.0 ##
1998-2020	186	54.4	8	4.3	19.4	11.6	46.2	98.4

186 cases diagnosed 1998-2020 are related to a total of 185 patients. Currently, in 53 (28.6 %) of these 185 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 37 / 11 / 5 (20.0 % / 5.9 % / 2.7 %) patients exist having 2 / 3 / 4+ malignancies.

- # The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.
- ## Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:

In 2018, a subgroup of 14 cases has been diagnosed, of which 17.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (FEMALES) (incl. DCO)

					Prop.			
					at least	Prop.		
					1 further	at least		
					malign.	1 further		Prop.
			DCO	Prop.	prior +	malign.	Prop.	actively
Year of	Females	Females	cases	DCO	synchron.	after		followed
diagnosis	n	90	n	90	°0	00	00	00
1998	2	33.3			0.0	7.8	50.0	100.0
1999	1	25.0			0.0	7.2	100.0	100.0
2000	1	33.3			0.0	7.3	100.0	100.0
2001	3	75.0	1	33.3	0.0	7.3	66.7	100.0
2002	4	30.8			0.0	6.8	75.0	100.0 #
2003	1	20.0			0.0	7.0	100.0	100.0
2004	7	58.3	1	14.3	0.0	6.3	57.1	85.7
2005	3	37.5			0.0	5.9		100.0
2006	6	40.0			3.6	6.1	66.7	100.0
2007	11	61.1	1	9.1	2.6	6.3	54.5	81.8 #
2008	9	45.0	1	11.1	4.2	5.2	55.6	88.9
2009	13	52.0			8.2	5.7	76.9	100.0
2010	9	64.3			8.6	4.3	88.9	100.0
2011	8	53.3	1	12.5	7.7	3.6	50.0	100.0
2012	8	40.0			7.0	2.6	37.5	87.5
2013	7	38.9	1	14.3	7.5	2.9	57.1	85.7
2014	3	16.7			8.3	1.6	66.7	100.0
2015	10	55.6			9.4	1.7	30.0	80.0
2016	7	58.3			9.7	2.0		100.0
2017	8	50.0	1	12.5	10.7	2.3	50.0	100.0
2018	13	48.1			11.9	2.9	7.7	100.0
2019	9	32.1			13.3	4.5	11.1	100.0
2020	13	56.5			12.8	0.0		100.0 ##
1998-2020	156	45.6	7	4.5	12.8	7.8	43.6	94.9
1990-2020	TJO	42.0	1	4.0	12.0	/.0	43.0	24.2

156 cases diagnosed 1998-2020 are related to a total of 156 patients. Currently, in 31 (19.9 %) of these 156 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 25 / 6 / 0 (16.0 % / 3.8 % / 0.0 %) patients exist having 2 / 3 / 4+ malignancies.

- # The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.
- ## Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:

In 2018, a subgroup of 13 cases has been diagnosed, of which 11.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Incidence measures by year of diagnosis including DCO cases (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

			Males		Males		Males		Males	
Year of	Males	Females	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
diagnosis	n	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	4	2	0.4	0.2	0.2	0.1	0.3	0.1	0.4	0.2
1999	3	1	0.3	0.1	0.3	0.0	0.3	0.1	0.3	0.1
2000	2	1 /	0.2	0.1	0.2	0.0	0.2	0.0	0.2	0.1
2001	1	3	0.1	0.2	0.0	0.1	0.1	0.2	0.1	0.2
2002	9	4	0.5	0.2	0.4	0.1	0.4	0.1	0.5	0.1
2003	4	1	0.2	0.1	0.1	0.0	0.2	0.0	0.2	0.0
2004	5	7	0.3	0.4	0.2	0.2	0.2	0.3	0.3	0.3
2005	5	3	0.3	0.2	0.2	0.1	0.2	0.2	0.3	0.2
2006	9	6	0.5	0.3	0.3	0.2	0.4	0.2	0.5	0.2
2007	7	11	0.3	0.5	0.2	0.3	0.3	0.4	0.3	0.4
2008	11	9	0.5	0.4	0.3	0.2	0.4	0.3	0.5	0.3
2009	12	13	0.5	0.6	0.3	0.3	0.4	0.4	0.5	0.5
2010	5	9	0.2	0.4	0.1	0.2	0.1	0.3	0.2	0.3
2011	7 /	8	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.3
2012	12	8	0.5	0.3	0.4	0.2	0.5	0.3	0.5	0.3
2013	11	7	0.5	0.3	0.3	0.1	0.4	0.2	0.4	0.3
2014	15	3	0.6	0.1	0.4	0.1	0.5	0.1	0.6	0.1
2015	8	10	0.3	0.4	0.2	0.2	0.2	0.3	0.3	0.4
2016	5	7	0.2	0.3	0.1	0.1	0.2	0.2	0.2	0.2
2017	8	8	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.3
2018	14	13	0.6	0.5	0.4	0.2	0.5	0.4	0.5	0.4
2019	19	9	0.8	0.4	0.5	0.2	0.6	0.3	0.7	0.3
2020	10	13	0.4	0.5	0.2	0.2	0.3	0.3	0.4	0.4
1998-2020	186	156	0.4	0.3	0.2	0.2	0.3	0.2	0.4	0.3

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.

Age distribution parameters by year of diagnosis (ALL PATIENTS) (incl. DCO)

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
-										
1998	6	58.9	17,1	31.0	80.7	31.0	50.5	60.9	69.3	80.7
1999	4	52.9	26.9	14.7	72.5	14.7	34.1	62.2	71.7	72.5
2000	3	54.4	30.6	20.0	78.7	20.0	20.0	64.4	78.7	78.7
2001	4	69.4	5.0	63.2	75.3	63.2	65.8	69.6	73.1	75.3
2002	13	61.4	18.4	28.0	92.7	43.6	45.2	67.3	73.3	81.4
2003	5	56.7	13.5	40.7	72.7	40.7	46.0	57.1	66.9	72.7
2004	12	55.2	19.2	20.2	82.1	33.3	36.3	62.3	65.2	78.1
2005	8	56.3	21.0	18.1	82.4	18.1	43.3	62.6	69.1	82.4
2006	15	59.0	14.5	30.8	83.0	44.7	46.6	59.1	71.8	76.5
2007	18	57.4	13.8	33.5	86.4	40.6	45.5	55.4	63.6	78.9
2008	20	62.0	18.3	29.4	87.6	35.0	42.9	65.6	77.7	82.0
2009	25	62.4	15.7	19.5	89.9	45.9	51.9	64.7	74.1	78.5
2010	14	61.3	16.8	39.1	86.2	39.2	42.2	65.8	72.9	84.0
2011	15	63.3	14.7	42.3	84.7	43.1	50.5	62.3	80.4	83.5
2012	20	57.8	17.2	22.4	82.8	37.4	40.2	62.2	67.6	80.8
2013	18	66.3	13.0	29.6	83.5	49.7	59.8	67.9	76.1	82.7
2014	18	63.2	9.9	48.3	79.1	48.4	56.9	66.1	70.5	78.3
2015	18	63.6	12.4	44.9	86.0	50.1	54.2	59.9	76.5	81.9
2016	12	66.5	14.8	40.5	87.3	49.0	53.3	71.6	78.4	79.4
2017	16	65.5	10.5	48.6	84.6	49.9	58.6	65.8	71.3	80.7
2018	27	62.3	16.1	30.8	90.6	38.4	49.4	66.5	75.3	79.5
2019	28	59.7	13.7	30.1	84.3	41.6	51.7	60.5	67.3	79.6
2020	23	66.7	14.1	30.3	88.2	49.8	59.7	67.9	78.6	84.3
1998-2020	342	61.7	15.3	14.7	92.7	40.7	51.0	63.7	72.9	79.8

Table 3a

Age distribution parameters by year of diagnosis (MALES) (incl. DCO)

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
-										
1998	4	55.1	20.6	31.0	80.7	31.0	40.8	54.3	69.4	80.7
1999	3	46.9	29.5	14.7	72.5	14.7	14.7	53.6	72.5	72.5
2000	2	42.2	31.3	20.0	64.4	20.0	20.0	42.2	64.4	64.4
2001	1	75.3		75.3	75.3	75.3	75.3	75.3	75.3	75.3
2002	9	56.8	16.2	28.0	74.3	28.0	45.2	55.2	72.9	74.3
2003	4	52.6	11.7	40.7	66.9	40.7	43.3	51.5	62.0	66.9
2004	5	55.8	19.9	20.2	65.8	20.2	64.1	64.4	64.5	65.8
2005	5	59.9	24.7	18.1	82.4	18.1	60.9	65.8	72.5	82.4
2006	9	56.6	14.7	30.8	76.5	30.8	46.6	55.7	69.0	76.5
2007	7	61.4	15.3	33.5	78.9	33.5	52.5	62.8	76.9	78.9
2008	11	62.6	17.8	29.4	84.7	41.9	43.8	66.5	78.8	79.4
2009	12	62.8	18.9	19.5	89.9	45.9	50.7	68.3	75.1	78.1
2010	5	69.3	15.3	44.6	86.2	44.6	70.2	70.8	74.9	86.2
2011	7	57.1	13.8	42.3	82.4	42.3	43.9	55.0	64.7	82.4
2012	12	59.6	16.8	22.4	82.8	37.1	53.2	63.4	66.5	80.2
2013	11	63.0	13.7	29.6	76.8	49.7	57.4	67.4	73.6	73.6
2014	15	62.0	10.4	48.3	79.1	48.4	51.3	59.2	70.5	78.3
2015	8	70.7	11.4	54.2	86.0	54.2	60.7	72.8	79.3	86.0
2016	5	66.5	15.6	49.4	87.3	49.4	57.2	60.6	77.8	87.3
2017	8	63.2	9.8	48.6	79.7	48.6	56.8	62.4	69.3	79.7
2018	14	58.8	17.2	30.8	90.6	38.4	48.3	53.2	73.7	79.5
2019	19	58.3	15.4	30.1	84.3	33.4	48.3	59.3	64.3	79.8
2020	10	61.4	16.4	30.3	84.3	37.6	52.8	63.4	73.2	81.9
1998-2020	186	60.4	15.9	14.7	90.6	40.7	50.5	62.3	72.5	79.5

Table 3b

Age distribution parameters by year of diagnosis (FEMALES) (incl. DCO)

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	2	66.5	3.9	63.8	69.3	63.8	63.8	66.5	69.3	69.3
1999	1	70.9		70.9	70.9	70.9	70.9	70.9	70.9	70.9
2000	1	78.7		78.7	78.7	78.7	78.7	78.7	78.7	78.7
2001	3	67.5	3.9	63.2	71.0	63.2	63.2	68.3	71.0	71.0
2002	4	71.6	21.1	43.6	92.7	43.6	56.2	75.1	87.0	92.7
2003	1	72.7		72.7	72.7	72.7	72.7	72.7	72.7	72.7
2004	7	54.8	20.3	33.3	82.1	33.3	34.5	56.9	78.1	82.1
2005	3	50.3	15.0	34.5	64.3	34.5	34.5	52.2	64.3	64.3
2006	6	62.5	14.9	44.7	83.0	44.7	47.4	63.9	71.8	83.0
2007	11	54.9	12.9	40.6	86.4	44.3	45.3	52.5	61.9	65.1
2008	9	61.3	19.8	31.9	87.6	31.9	41.2	64.7	77.6	87.6
2009	13	62.1	12.7	41.4	81.9	47.9	53.4	59.9	72.9	78.5
2010	9	56.9	16.7	39.1	84.0	39.1	42.2	60.9	65.8	84.0
2011	8	68.7	14.0	43.1	84.7	43.1	61.5	67.7	81.9	84.7
2012	8	55.1	18.5	37.6	81.5	37.6	38.9	50.0	72.1	81.5
2013	7	71.7	10.4	59.5	83.5	59.5	59.8	76.1	82.7	83.5
2014	3	69.3	1.7	68.0	71.2	68.0	68.0	68.5	71.2	71.2
2015	10	57.8	10.3	44.9	79.4	47.5	50.6	56.1	60.0	74.9
2016	7	66.6	15.5	40.5	79.4	40.5	49.0	72.1	79.1	79.4
2017	8	67.8	11.4	49.9	84.6	49.9	60.0	68.2	75.6	84.6
2018	13	66.2	14.4	38.4	85.8	40.1	57.5	70.9	75.3	77.9
2019	9	62.5	9.3	46.9	78.3	46.9	56.0	63.9	68.0	78.3
2020	13	70.8	11.0	49.8	88.2	59.7	64.4	69.0	78.6	84.5
1998-2020	156	63.2	14.5	31.9	92.7	40.6	52.3	65.4	74.7	81.9

Age distribution by 5-year age group and sex for period 2007-2020 (incl. DCO)

Age at									
diagnosis	Cases			Males			Females		
Years	n	00	Cum.%	n	00	Cum.%	n	00	Cum.%
0-4									
5-9									
10-14									
15-19	1	0.4	0.4	1	0.7	0.7			0.0
20-24	1	0.4	0.7	1	0.7	1.4			0.0
25-29	2	0.7	1.5	2	1.4	2.8			0.0
30-34	6	2.2	3.7	5	3.5	6.3	1	0.8	0.8
35-39	9	3.3	7.0	2	1.4	7.6	7	5.5	6.3
40 - 44	20	7.4	14.3	9	6.3	13.9	11	8.6	14.8
45-49	18	6.6	21.0	11	7.6	21.5	7	5.5	20.3
50-54	23	8.5	29.4	14	9.7	31.3	9	7.0	27.3
55-59	33	12.1	41.5	17	11.8	43.1	16	12.5	39.8
60-64	33	12.1	53.7	21	14.6	57.6	12	9.4	49.2
65-69	35	12.9	66.5	15	10.4	68.1	20	15.6	64.8
70-74	27	9.9	76.5	14	9.7	77.8	13	10.2	75.0
75-79	36	13.2	89.7	20	13.9	91.7	16	12.5	87.5
80-84	19	7.0	96.7	7	4.9	96.5	12	9.4	96.9
85+	9	3.3	100.0	5	3.5	100.0	4	3.1	100.0
All ages	272	100.0		144	100.0		128	100.0	

Age-specific incidence, DCO rate and proportion of all cancers for period 2007-2020

							Males	Females
			Males	Females	Males	Females	Prop.all	Prop.all
Age at			Age-	Age-	DCO rate	DCO rate	cancers	cancers
diagnosis	Males	Females	spec.	spec.	n=4	n=5	n=153686	n=155051
Years	n	n	incid.	incid.	00	90	00	00
0- 4								
5- 9								
10-14								
15-19	1		0.1				0.3	
20-24	1		0.0				0.2	
25-29	2		0.1				0.2	
30-34	5	1	0.2	0.0			0.4	0.0
35-39	2	7	0.1	0.3			0.1	0.2
40 - 44	9	11	0.4	0.5			0.3	0.2
45-49	11	7	0.4	0.3			0.2	0.1
50-54	14	9	0.5	0.4			0.2	0.1
55-59	17	16	0.8	0.7			0.1	0.1
60-64	21	12	1.2	0.6			0.1	0.1
65-69	15	20	0.9	1.1		5.0	0.1	0.1
70-74	14	13	0.9	0.8	14.3		0.1	0.1
75-79	19	16	1.6	1.1	5.3	6.3	0.1	0.1
80-84	7	12	1.0	1.1		8.3	0.0	0.1
85+	5	4	1.1	0.4	20.0	50.0	0.0	0.0
All ages	143	128			2.8	3.9	0.1	0.1
Incidence								
Raw			0.4	0.4				
WS			0.3	0.2				
ES			0.4	0.3				
BRD-S			0.4	0.3				

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

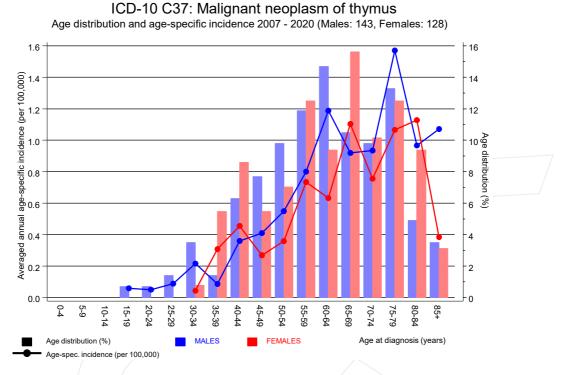


Figure 6. Age distribution (males: mean=61.7 yrs, median=62.7 yrs; females: mean=63.3 yrs, median=65.4 yrs) and age-specific incidence.



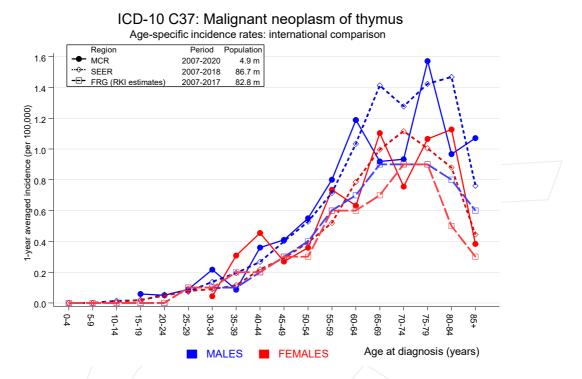


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).



Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021 Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 submission. http://www.seer.cancer.gov.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998-2020 MALES

	Observed /	Expected		CI	CI		DCO
Diagnosis	n	n	SIR	95%	95%	EAR	00
C15 Oesophagus	/ 1 /	0.1	6.8	0.2	37.7	14.4	
C16 Stomach	1	0.3	3.8	0.1	21.2	12.5	
C19-C20 Rectum	/ 1/	0.4	2.6	0.1	14.7	10.5	
C25 Pancreas	1	0.3	3.6	0.1	20.2	12.2	
C37 Thymus	1	0.0	199.6	5.1	1112 #	16.8	100.0
C38,C45 Mesothelioma	1	0.0	20.9	0.5	116.6	16.1	
C43 Malign. melanoma	5	0.3	14.9	4.9	34.9 #	58.9	
C61 Prostate	8	1.9	4.1	1.8	8.2 #	102.7	
C62 Testis	1	0.0	26.0	0.7	145.1	16.3	
C64 Kidney	1	0.2	4.1	0.1	22.7	12.8	
C73 Thyroid	1	0.1	18.8	0.5	104.7	16.0	
C82-C85 NHL	2	0.3	6.7	0.8	24.2	28.8	
Not observed	0	3.1	0.0	0.0	1.2	-51.8	
All further malignancies	24	7.1	3.4	2.2	5.0 #	286.2	4.2
Patients		181	_				
Median age at next malignar	ncy (years) 67.1	_				
Person-years		591	_				
Mean observation time (year	cs)	3.3	3				
Median observation time (ye		1.4	ł				

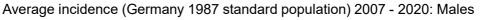
The occurrence of further specified malignancy is statistically significant.

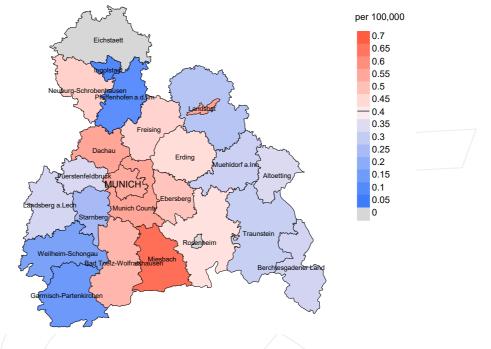
Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998-2020 FEMALES

	Observed E:	xpected		CI	CI		DCO
Diagnosis	n	n	SIR	95%	95%	EAR	olo
C22 Liver	/ 1/	0.1	17.9	0.5	99.7	19.5	100.0
C25 Pancreas	1/	0.2	4.9	0.1	27.3	16.5	
C33-C34 Lung	2	0.4	5.3	0.6	19.2	33.6	
C43 Malign. melanoma	1	0.2	5.3	0.1	29.5	16.8	
C50 Breast	5	1.5	3.4	1.1	7.8 #	72.7	
C54 Corpus uteri	1	0.3	3.8	0.1	21.0	15.2	
C82-C85 NHL	1	0.2	5.8	0.1	32.5	17.1	
Not observed	0	1.9	0.0	0.0	1.9	-39.8	
All further malignancies	12	4.7	2.6	1.3	4.5 #	151.6	8.3
Patients		149					
Median age at next malignand	cy (years)	67.5					
Person-years		483					
Mean observation time (years	3)	3.2					
Median observation time (yea	ars)	1.5					

The occurrence of further specified malignancy is statistically significant.





verage incidence (Germany 1987 standard population) 2007 - 2020: Females

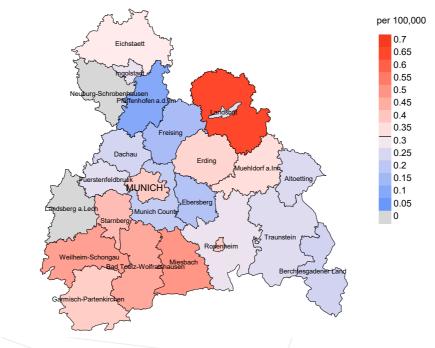
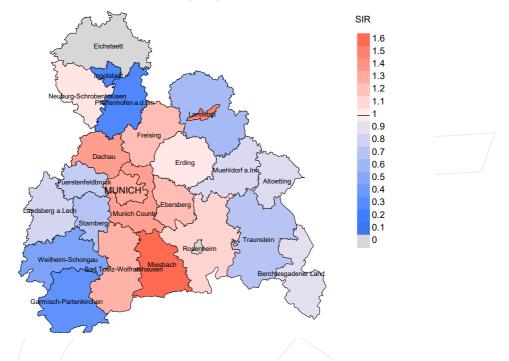


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.4/100,000 WS N=143, females 0.3/100,000 WS N=128).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 2 women were identified with newly diagnosed thymus cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.9/100,000.



Standardized incidence ratio (SIR) 2007 - 2020: Males

Standardized incidence ratio (SIR) 2007 - 2020: Females

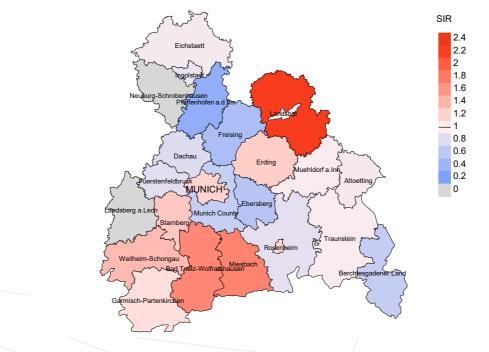


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=143, females N=128).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 2 women were identified with newly diagnosed thymus cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.56. Though, the value of this parameter may vary with an underlying probability of 99% between 0.03 and 2.59, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

						Prop.
		Prop.				deaths
	Incident	actively	Prop.		Prop.	with death
Year of	cases	followed	DCO	Deaths	deaths	certific.
diagnosis	n	00	00	n	00	00
1998	6	100.0		3	50.0	100.0
1999	4	100.0		2	50.0	100.0
2000	3	100.0		3	100.0	100.0
2000	4	100.0	50.0	3	75.0	100.0
2002	1/3	92.3	50.0	11	84.6	100.0
2003	5	100.0		4	80.0	100.0
2004	12	91.7	8.3	8	66.7	100.0
2005	8	100.0	12.5	5	62.5	80.0
2006	15	86.7	6.7	10	66.7	90.0
2007	18	88.9	5.6	10	55.6	100.0
2008	20	95.0	10.0	11	55.0	100.0
2009	25	100.0	4.0	17	68.0	94.1
2010	14	100.0		8	57.1	100.0
2011	15	100.0	6.7	7	46.7	100.0
2012	20	95.0		9	45.0	100.0
2013	18	94.4	5.6	10	55.6	90.0
2014	18	100.0	5.6	8	44.4	100.0
2015	18	88.9		6	33.3	66.7
2016	12	100.0		2	16.7	100.0
2017	16	100.0	12.5	6	37.5	83.3
2018	27	100.0	3.7	4	14.8	25.0
2019	28	100.0		6	21.4	66.7
2020	23	100.0		1	4.3	
1998-2020	342	96.8	4.4	154	45.0	91.6



Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

			Prop.		
			deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	n	90	n	010
1998	6	1	100.0		
1999	4	1	100.0		
2000	3	2	100.0		
2001	4	3	66.7	1	25.0
2002	13	6	100.0	2	15.4
2003	5	8	100.0		
2004	12	6	100.0	1	8.3
2005	8	2	100.0	1	12.5
2006	15	13	100.0	2	13.3
2007	18	7	100.0	2	11.1
2008	20	7	100.0	3	15.0
2009	25	13	100.0	4	16.0
2010	14	13	100.0	2	14.3
2011	15	11	100.0	2	13.3
2012	20	12	100.0	1	5.0
2013	18	4	100.0	1 3 1	16.7
2014	18	15	100.0	1	5.6
2015	18	14	100.0	/1 /	5.6
2016	12	9	100.0		
2017	16	10	100.0	2	12.5
2018	27	12	50.0	2	7.4
2019	28	9	44.4	3	10.7
2020	23	10	90.0		
1998-2020	342	188	93.1	33	9.6

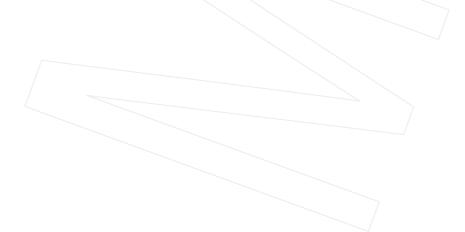


Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancerrelated deaths, and cancer recorded on death certificates (incl. DCO) (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

		Prop. cancer-	Prop. non-cancer-	Prop. cancer recorded on death	
Year of	Deaths	related	related	certificate	
death	n	%	%	%	
1998	1	100.0		100.0	
1999	1		100.0		
2000	2	50.0	50.0	100.0	
2001	3	100.0		100.0	
2002	6	50.0	50.0	83.3	
2003	8	62.5	37.5	62.5	
2004	6	100.0		100.0	
2005	2	50.0	50.0	50.0	
2006	13	69.2	30.8	76.9	
2007	7	85.7	14.3	100.0	
2008	7	85.7	14.3	100.0	
2009	13	76.9	23.1	76.9	
2010	13	53.8	46.2	69.2	
2011	11	81.8	18.2	72.7	
2012	12	75.0	25.0	83.3	
2013	4	75.0	25.0	75.0	
2014	15	73.3	26.7	73.3	
2015	14	64.3	35.7	71.4	
2016	9	77.8	22.2	100.0	
2017	10	70.0	30.0	80.0	
2018	12	50.0	50.0	33.3	
2019	9	44.4	55.6	25.0	
2020	10	70.0	30.0	66.7	
1998-2020	188	69.1	30.9	76.0	



Table 10a

Medians of age at death according to the grouping in Table 9 $$\rm MALES$$

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer- related) Years	Age at death (non-cancer- related) Years	Age at death (according to death certificate) Years
1998	1	66.5	66.5		66.5
1999	1	46.4		46.4	
2000	1	35.1		35.1	35.1
2001	3	61.9	61.9		68.6
2002	3	55.2	21.7	66.0	55.2
2003	4	66.2	55.8	86.0	55.8
2004	6	68.7	68.7		68.7
2005	1	69.2		69.2	
2006	9	62.9	54.4	66.1	60.7
2007	6	69.9	66.4	73.4	69.9
2008	4	78.7	78.7		78.7
2009	7	76.2	69.9	81.5	69.9
2010	7	77.0	76.0	79.5	75.1
2011	5	79.9	66.9	81.3	66.9
2012	6	68.1	68.1	67.5	67.8
2013	3	68.5	68.5		68.5
2014	9	73.5	72.9	78.7	73.2
2015	7	71.9	71.7	81.2	71.8
2016	4	64.5	62.7	66.0	64.5
2017	3	72.3	72.3		72.3
2018	8	83.8	89.1	80.9	58.9
2019	4	79.6	79.1	80.2	
2020	6	61.1	40.9	70.2	41.8
1998-2020	108	70.2	68.4	75.5	68.5

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 10b

Medians of age at death according to the grouping in Table 9 $$\operatorname{FEMALES}$

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer- related) Years	Age at death (non-cancer- related) Years	Age at death (according to death certificate) Years
1998					
1999					
2000	1	71.7	71.7		71.7
2001					
2002	3	66.1	73.8	64.3	73.8
2003	4	73.2	63.2	83.8	63.2
2004					
2005	1	79.0	79.0		79.0
2006	4	77.3	74.4	82.0	74.4
2007	1	75.1	75.1		75.1
2008	3 6 6	60.1	58.7	60.1	60.1
2009	6	69.1	65.1	74.0	65.1
2010	6	78.4	66.2	87.1	74.9
2011	6	43.7	43.7		43.6
2012	6	68.7	67.7	69.7	67.7
2013	1	92.3		92.3	
2014	6	79.9	73.0	90.7	69.8
2015	7	73.1	72.4	75.2	72.4
2016	5	69.9	69.9		69.9
2017	7	71.9	60.4	86.8	71.9
2018	4	79.3	73.4	85.5	71.6
2019	5	86.7	86.7	73.8	86.7
2020	4	77.8	77.8		77.8
1998-2020	80	72.7	70.8	84.2	70.8

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 11a

Mortality measures (cancer-related death) and mortality-incidence-index by year of death MALES

Year of	Deaths	Mort.	MI-Index	Mort. N	4I-Index	: Mort. I	4I-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	1	0.1	0.25	0.1	0.32	0.1	0.29	0.1	0.23
1999									
2000									
2001	3	0.3	3.00	0.2	3.89	0.2	2.93	0.3	2.07
2002	1	0.1	0.11	0.1	0.21	0.1	0.14	0.1	0.16
2003	3	0.2	0.75	0.1	0.69	0.1	0.78	0.2	0.98
2004	6	0.3	1.20	0.2	0.86	0.2	1.12	0.3	1.28
2005									
2006	7	0.4	0.78	0.3	0.90	0.3	0.78	0.4	0.79
2007	5	0.2	0.71	0.1	0.56	0.2	0.58	0.2	0.70
2008	4	0.2	0.40	0.1	0.29	0.1	0.36	0.2	0.49
2009	5	0.2	0.42	0.1	0.33	0.2	0.37	0.2	0.39
2010	4	0.2	0.80	0.1	0.81	0.1	0.87	0.2	1.18
2011	3	0.1	0.43	0.1	0.33	0.1	0.36	0.1	0.46
2012	4	0.2	0.33	0.1	0.27	0.1	0.31	0.2	0.31
2013	3	0.1	0.27	0.1	0.27	0.1	0.28	0.1	0.27
2014	7	0.3	0.47	0.1	0.40	0.2	0.43	0.3	0.45
2015	5	0.2	0.63	0.1	0.63	0.1	0.63	0.2	0.58
2016	2	0.1	0.40	0.1	0.46	0.1	0.45	0.1	0.39
2017	3	0.1	0.38	0.0	0.26	0.1	0.29	0.1	0.38
2018	4	0.2	0.29	0.1	0.17	0.1	0.23	0.1	0.24
2019	1	0.0	0.05	0.0	0.02	0.0	0.03	0.0	0.05
2020	3	0.1	0.30	0.1	0.40	0.1	0.36	0.1	0.30
1998-2020	74	0.2	0.40	0.1	0.35	0.1	0.37	0.2	0.40

Table 11b

Mortality measures (cancer-related death) and mortality-incidence-index by year of death FEMALES

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	« Mort. N	4I-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998									
1999									
2000	1	0.1	1.00	0.0	1.97	0.1	1.48	0.1	1.03
2001									
2002	2	0.1	0.50	0.0	0.43	0.1	0.46	0.1	0.55
2003	2	0.1	2.00	0.1	2.58	0.1	2.47	0.1	2.11
2004									
2005	1	0.1	0.33	0.0	0.11	0.0	0.18	0.0	0.32
2006	2	0.1	0.33	0.0	0.22	0.1	0.28	0.1	0.37
2007	1	0.0	0.09	0.0	0.04	0.0	0.06	0.0	0.10
2008	2	0.1	0.22	0.1	0.30	0.1	0.30	0.1	0.25
2009	5	0.2	0.38	0.1	0.37	0.2	0.36	0.2	0.38
2010	3	0.1	0.33	0.1	0.25	0.1	0.30	0.1	0.34
2011	6	0.3	0.75	0.2	1.10	0.2	0.98	0.2	0.72
2012	5	0.2	0.63	0.1	0.43	0.1	0.50	0.2	0.52
2013									
2014	4	0.2	1.33	0.1	1.01	0.1	1.10	0.1	1.35
2015	4	0.2	0.40	0.1	0.27	0.1	0.29	0.1	0.32
2016	5	0.2	0.71	0.1	0.73	0.1	0.74	0.2	0.71
2017	4	0.2	0.50	0.1	0.56	0.1	0.52	0.1	0.55
2018	2	0.1	0.15	0.0	0.10	0.0	0.12	0.1	0.15
2019	3	0.1	0.33	0.0	0.19	0.1	0.21	0.1	0.22
2020	4	0.2	0.31	0.1	0.23	0.1	0.25	0.1	0.26
1998-2020	56	0.1	0.36	0.1	0.31	0.1	0.32	0.1	0.34

Age distribution of age at death (cancer-related) for period 2007-2020 (incl. multiple malignancies)

Age at									
death	Cases			Males			Females		
Years	n	00	Cum.%	n	010	Cum.%	n	olo	Cum.%
0-4 5-9 10-14 15-19 20-24									
25-29	0	0.0		0		2 0			0 0
30-34	2	2.0	2.0	2	3.8	3.8			0.0
35-39	0	0.0	2.0			3.8			0.0
40-44	5	5.0	6.9	1	1.9	5.7	4	8.3	8.3
45-49	5	5.0	11.9	2	3.8	9.4	3	6.3	14.6
50-54	7	6.9	18.8	2	3.8	13.2	5	10.4	25.0
55-59	7	6.9	25.7	5	9.4	22.6	2	4.2	29.2
60-64	6	5.9	31.7	3	5.7	28.3	3	6.3	35.4
65-69	19	18.8	50.5	10	18.9	47.2	9	18.8	54.2
70-74	16	15.8	66.3	9	17.0	64.2	7	14.6	68.8
75-79	12	11.9	78.2	8	15.1	79.2	4	8.3	77.1
80-84	12	11.9	90.1	6	11.3	90.6	6	12.5	89.6
85+	10	9.9	100.0	5	9.4	100.0	5	10.4	100.0
	± 0		200.0	Ŭ	5.1	200.0	Ň	±0•1	
All ages	101	100.0		53	100.0		48	100.0	

Age-specific mortality (cancer-related) and proportion of all cancers for period 2007-2020 (incl. multiple malignancies)

		Males		Females		Males	Females
Age at							Prop.all
		Age-		Age-		-	-
death	Males Females	/ = /		spec.		cancers	cancers
Years	n n	mortal.	MI-index	mortal.	MI-index	00	90
0- 4							
5-9							
10-14							
15-19							
20-24							
25-29							
30-34	2	0.1	0.40			1.4	
35-39	2	0.1	0.10			±• 1	
40 - 44	1 4	0.0	0.11	0.2	0.36	0.2	0.5
45-49	2 3	0.1	0.18	0.1	0.43	0.1	0.2
50-54	2 5	0.1	0.14	0.2	0.56	0.1	0.2
55-59	5 2	0.2	0.29	0.1	0.13	0.1	0.1
60-64	3 3	0.2	0.14	0.2	0.25	0.0	0.1
65-69	10 9	0.6	0.67	0.5	0.45	0.1	0.1
70-74	9 7	0.6	0.64	0.4	0.54	0.1	0.1
75-79	8 4	0.7	0.42	0.3	0.25	0.1	0.0
80-84	6 6	0.8	0.86	0.6	0.50	0.1	0.1
85+	5 5	1.1	1.00	0.5	1.25	0.1	0.0
All ages	53 48					0.1	0.1
AII ayes	33 40					0.1	0.1
Mortality							
Raw		0.2	0.37	0.1	0.38		
WS		0.1	0.30	0.1	0.33		
ES		0.1	0.33	0.1	0.34		
BRD-S		0.1	0.36	0.1	0.35		
DIAD 5		0.1	0.50	0.1	0.55		
PYLL-70							
per 100,000		1.0		1.2			
ES		0.9		1.0			
AYLL-70		11.7		12.9			

Table 14a

Further malignancies in deaths in period 1998-2020 $${\rm MALES}$$

					Syn-	Syn-		
					chron	chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	ଌ↓	n	~%	n	~%	n	¢₀
C09-C10 Oropharynx	1	2.9					1	100.0
C15 Oesophagus	1	2.9					1	100.0
C16 Stomach	/ 1 /	2.9					1	100.0
C18 Colon	2	5.7	2	100.0				
C19-C20 Rectum	1	2.9					1	100.0
C32 Larynx	3	8.6	1	33.3			2	66.7
C33-C34 Lung	4	11.4	1	25.0			3	75.0
C37 Thymus	1	2.9					1	100.0
C43 Malign. melanoma	2	5.7	1	50.0			1	50.0
C44 Skin others	2	5.7			1	50.0	1	50.0
C61 Prostate	9	25.7	6	66.7			3	33.3
C64 Kidney	2	5.7	1	50.0			1	50.0
C67 Bladder	2	5.7					2	100.0
C70-C72 CNS cancer	1	2.9					1	100.0
C73 Thyroid	1	2.9					1	100.0
C82-C85 NHL	2	5.7			1	50.0	1	50.0
All further malignancies	35	100.0	12	34.3	2	5.7	21	60.0

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 14b

Further malignancies in deaths in period 1998-2020 FEMALES

	Total	Total	Pre	Pre	Syn- chron ±30d	Syn- chron ±30d	Post	Post
Diagnosis	n	%↓	n	~%	n	¢	n	00
C18 Colon C19-C20 Rectum	1	5.9 5.9	1 1	100.0				
C22 Liver	2	11.8					2	100.0
C25 Pancreas	2	11.8					2	100.0
C33-C34 Lung	2	11.8					2	100.0
C44 Skin others	1	5.9					1	100.0
C50 Breast	5	29.4	3	60.0			2	40.0
C73 Thyroid	2	11.8	2	100.0				
C76-C79 CUP	1	5.9	1	100.0				
All further malignancies	17	100.0	8	47.1			9	52.9

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.



Age-specific mortality (cancer-related) and proportion of all cancers for period 2007-2020 (First primaries only *)

		Males		Females		Males	Females
Age at		Age-		Age-			Prop.all
death	Males Femal	/= /		spec.		cancers	cancers
Years	n n	/ = /	MT-index		MI-index		%
10010		morear.	in inden	morear.	iii iiiden	Ū	° /
0-4							
5-9							
10-14							
15-19							
20-24							
25-29							
30-34	2	0.1	0.40			1.4	
35-39	2	0.1	0.40			1.1	
40-44	1 4	0.0	0.13	0.2	0.40	0.2	0.5
45-49	2 3		0.13	0.2	0.40	0.2	0.2
50-54	2 5		0.22	0.1	0.45	0.1	0.2
55-59	5 2		0.13	0.2	0.14	0.1	0.2
60-64	2 3	0.2	0.12	0.1	0.14	0.0	0.1
65-69	10 8	0.1	0.12	0.2	0.57	0.0	0.1
70-74	7 2		0.91	0.4	0.37	0.1	0.1
75-79	6 4	0.5	0.64	0.1	0.22	0.1	0.0
80-84	4 4		1.00	0.3	0.40	0.1	0.1
	3 5				1.25		
85+	3 5	0.6	0.75	0.5	1.25	0.0	0.1
						0 1	0 1
All ages	44 40					0.1	0.1
NC 1 7 1 1							
Mortality		0 1	0.20	0 1	0 07		
Raw		0.1	0.39	0.1			
WS		0.1	0.32	0.1	0.34		
ES		0.1	0.35	0.1	0.34		
BRD-S		0.1	0.39	0.1	0.35		
PYLL-70							
per 100,000		1.0		1.2			
ES		0.9		1.0			
AYLL-70		11.9		13.3			

* See corresponding tables with multiple malignancies.

Age-specific mortality (cancer-related) and proportion of all cancers for period 2007-2020 (Single primaries only *)

		Males		Females		Males	Females
Age at		Age-		Age-			Prop.all
death	Males Fema	/= /		spec.		cancers	cancers
Years	n n	/ + /	MT-index	-	MI-index		8
10010						Ū	ů /
0- 4							
5-9							
10-14							
15-19							
20-24							
25-29							
30-34	2	0.1	0.40			1.5	
35-39	2	0.1	0.40			1.5	
40-44	1	4 0.0	0.13	0.2	0.40	0.2	0.5
40-44 45-49		3 0.0	0.13	0.2	0.40	0.2	0.2
43-49 50-54			0.11	0.1		0.1	0.2
55-59		5 0.1 2 0.2	0.15	0.2	0.56	0.1	0.2
60-64	1		0.31				
				0.2	0.30	0.0	0.1
65-69			0.80	0.3	0.42	0.1	0.1
70-74			0.63	0.1	0.22	0.1	0.0
75-79		3 0.4	0.63	0.2	0.30	0.1	0.0
80-84		3 0.1	0.25	0.3	0.30	0.0	0.0
85+	3	3 0.6	1.00	0.3	0.75	0.1	0.0
All ages	34 3	3				0.1	0.1
Mortality							
Raw		0.1	0.33	0.1			
WS		0.1	0.28	0.1	0.31		
ES		0.1	0.30	0.1	0.31		
BRD-S		0.1	0.32	0.1	0.31		
PYLL-70							
per 100,000		0.9		1.2			
ES		0.8		1.0			
AYLL-70		12.5		14.8			

* See corresponding tables with multiple malignancies.

(dashed line).

ICD-10 C37: Malignant neoplasm of thymus

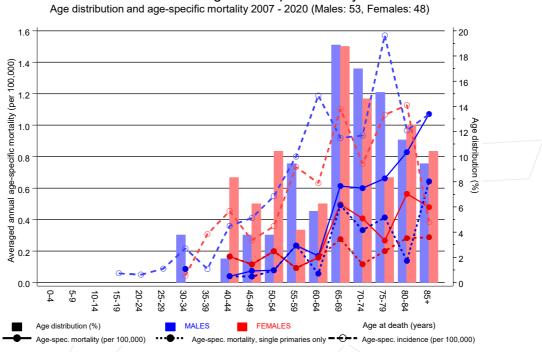
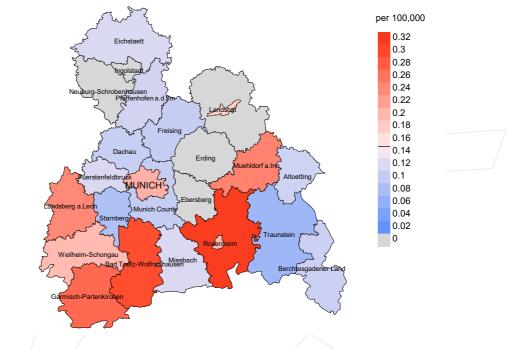


Figure 17. Distribution of age at death (bars; males: mean=63.3 yrs, median=65.8 yrs; females: mean=62.1 yrs, median=61.9 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison

The difference between age at diagnosis (Table 3) and age at thymus cancer-related death (see Table 10) should be considered.





verage mortality (Germany 1987 standard population) 2007 - 2020: Males

Average mortality (Germany 1987 standard population) 2007 - 2020: Females

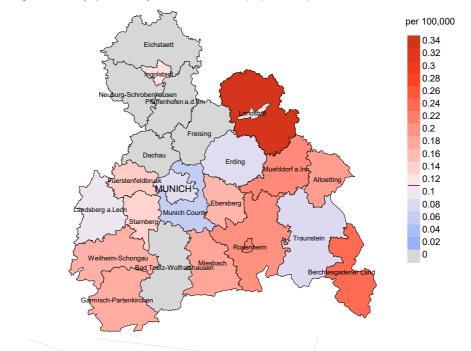
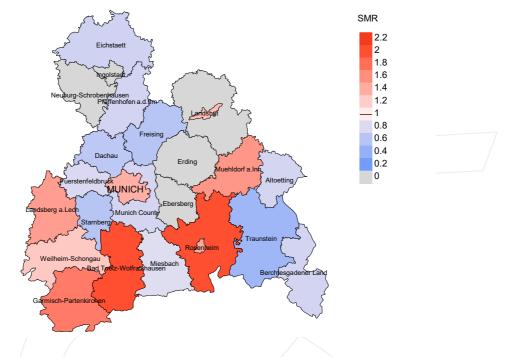


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.1/100,000 WS N=53, females 0.1/100,000 WS N=48).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 2 women died from thymus cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.9/100,000.



Standardized mortality ratio (SMR) 2007 - 2020: Males

Standardized mortality ratio (SMR) 2007 - 2020: Females

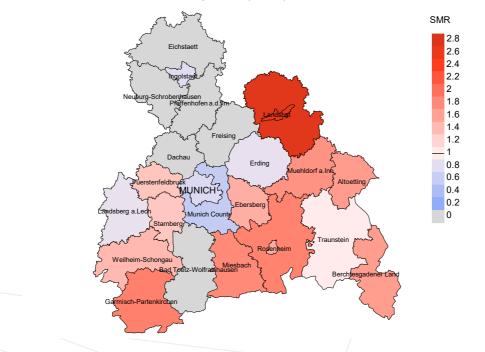


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=53, females N=48).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 2 women died from thymus cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.50. Though, the value of this parameter may vary with an underlying probability of 99% between 0.08 and 6.97, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. All multiple primaries included

The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. First singular primary (no information about other prior or synchronous malignancy)

The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. Single primary (no information about other prior, syn- or metachronous malignancy)

The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head&neck and lung).

The ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MIR. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID SEER	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.) Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S ES WS	German (FRG) standard population European standard population (old) World standard population
SIR CI EAR	Standardized incidence ratio Confidence interval Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70 AYLL-70	Potential years of life lost prior to age 70 given a person dies before that age Average years of life lost prior to age 70 given a person dies before that age
SMR MI-index	Standardized mortality ratio Ratio of mortality to incidence, MIR
FRG	Federal Republic of Germany

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